Nikon F

PHOTOMIC-T FINDER

(Work No. 20FD4)

REPAIR MANUAL

Tokyo, Japan

(67. 12. b) H

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NOTE: Marks in the "Term of Sale" column of the parts list are;

○ ..... Can be supplied individually

△ ..... Not supplied individually but only as subassembly

○△ ..... Supplied either as part or subassembly

× ..... Not considered as repair part

Ⓠ ..... Delivered as a product from the Sales Department

(i.e., not supplied as repair part)

Shutter and ASA dial assembly

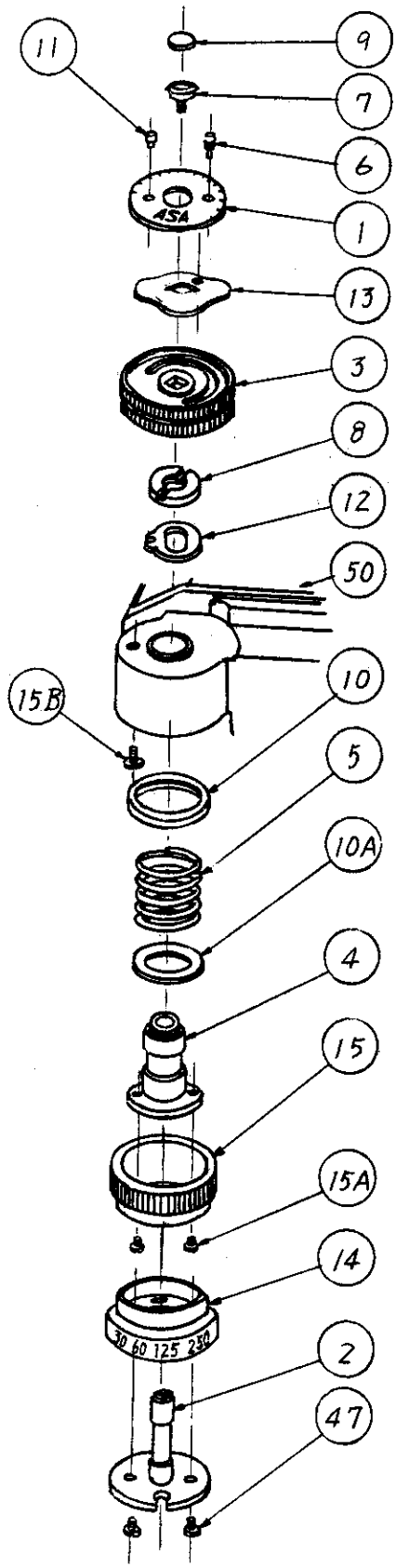

Fig. 1

Fig. 1

RA

Photomic body assembly

Fig. 2

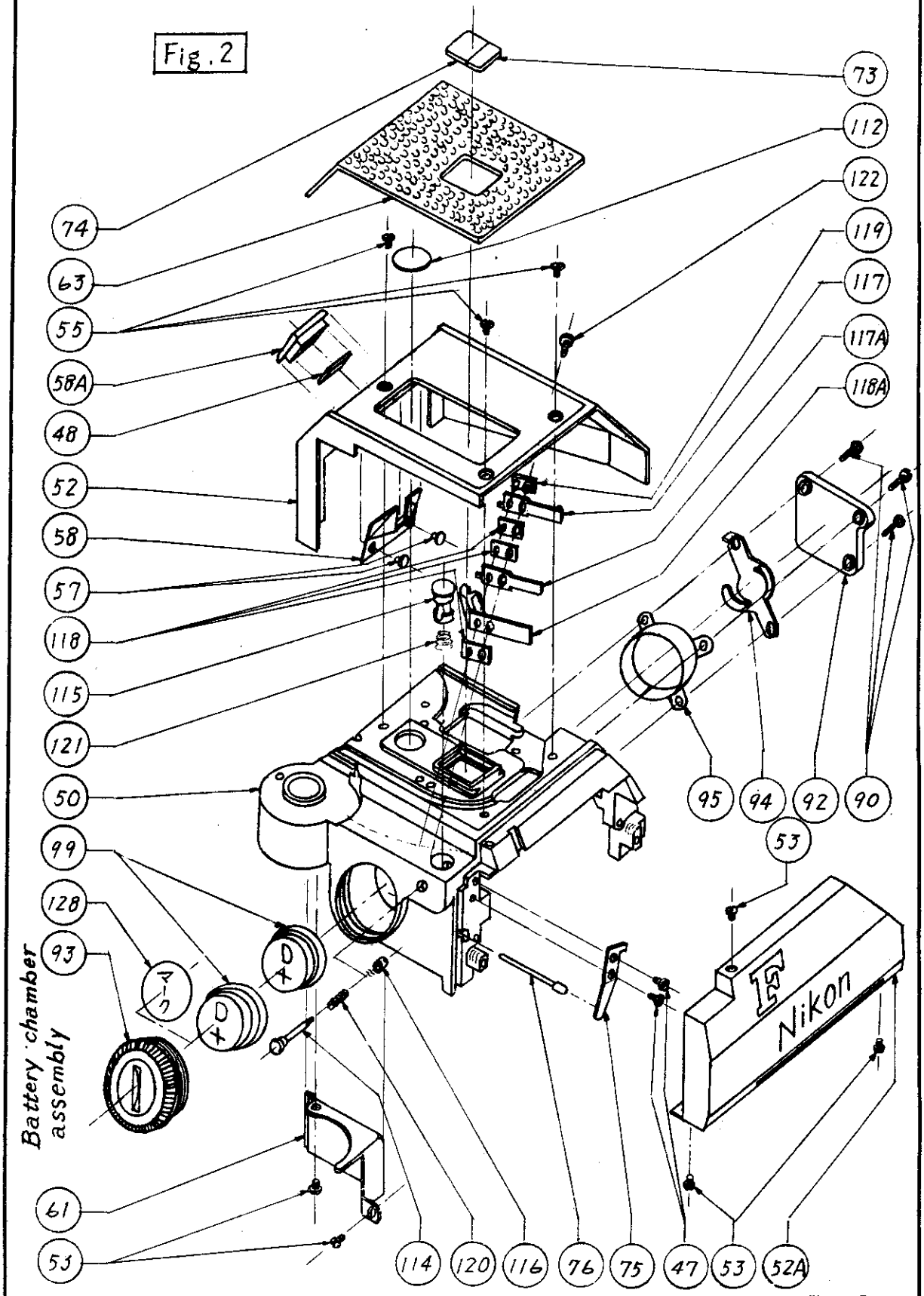

Fig. 2

RA

Fig. 3

Prism housing assembly

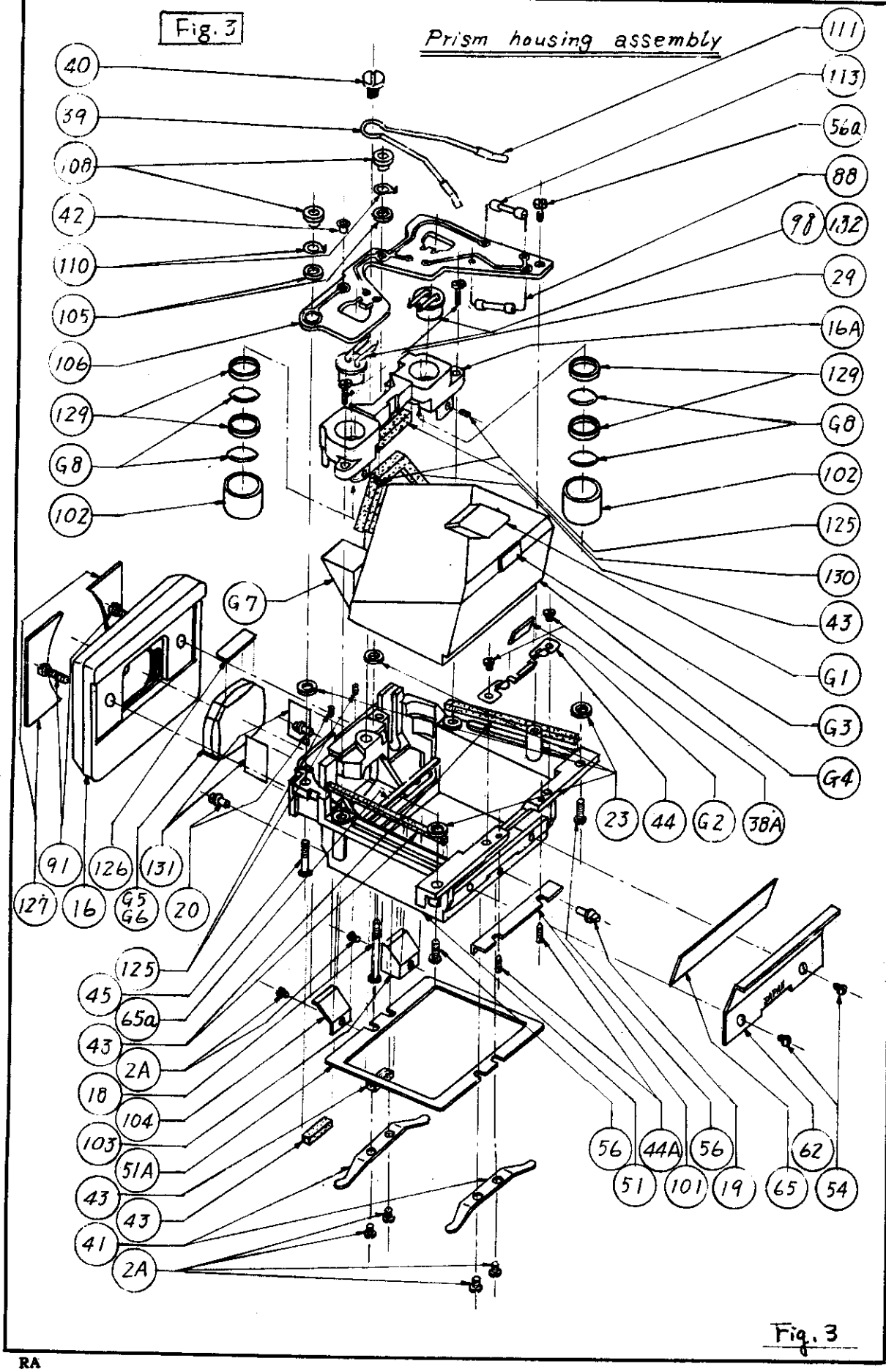

Fig. 3

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Aperture coupling assembly

Fig.4

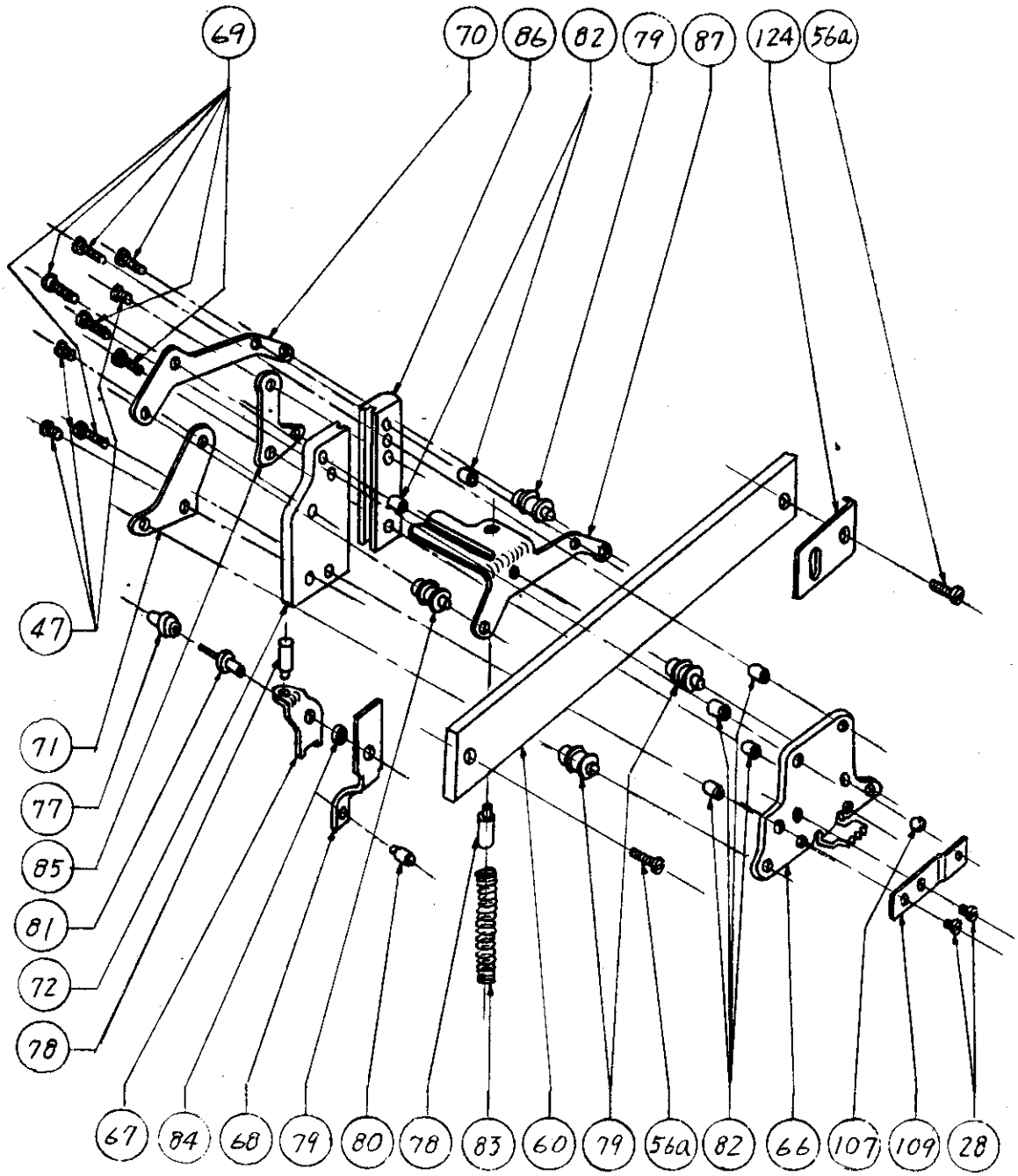


Fig.4

RA

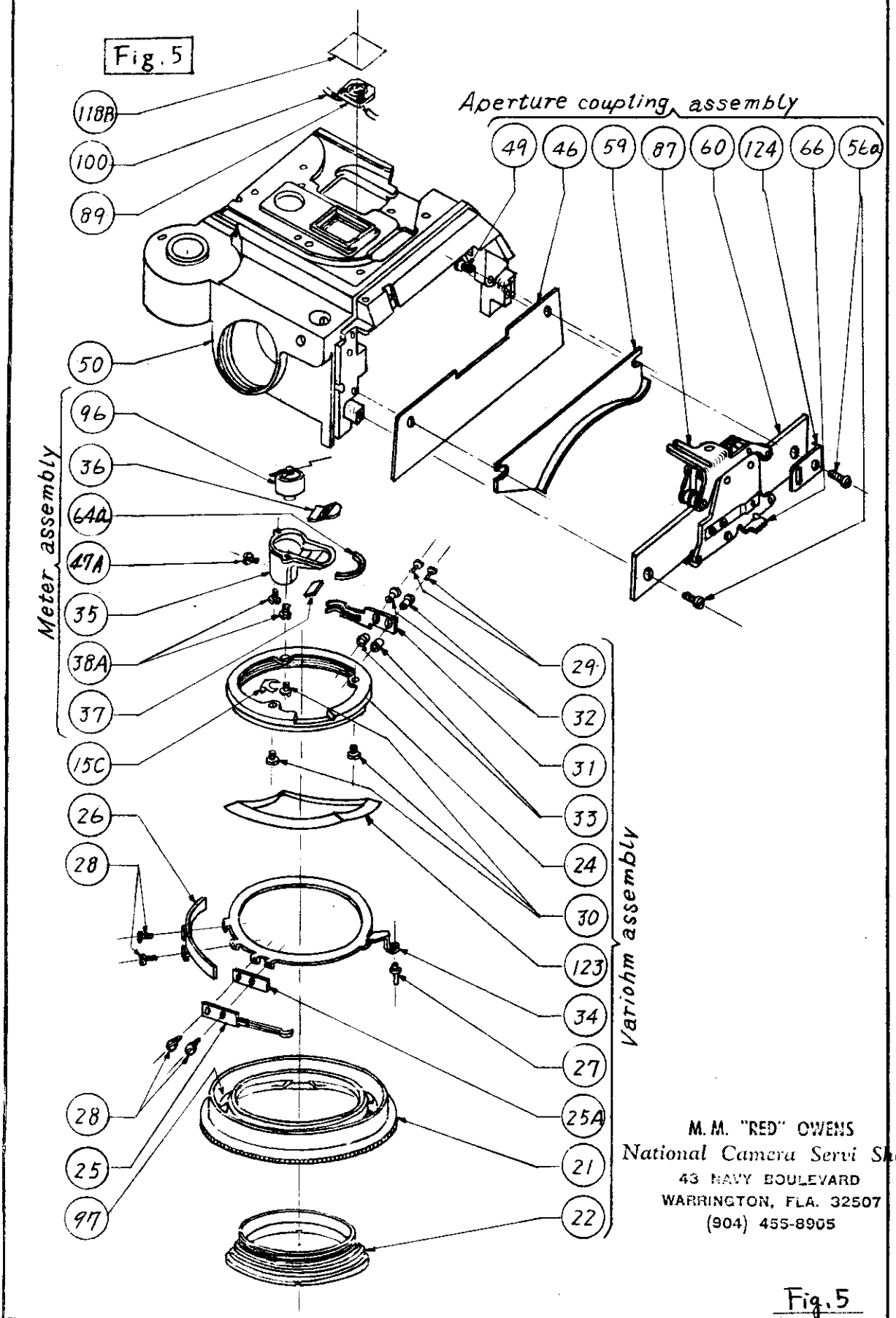


Fig. 5
118B
100
89
Aperture coupling assembly
49
46
59
87
60
124
66
56a
50
Meter assembly
96
36
64a
47A
35
38A
37
15C
26
28
28
25
97
29
32
31
33
24
30
123
34
27
25A
21
22
Variohm assembly
M. M. "RED" OWENS
National Camera Servi Shop
43 NAVY BOULEVARD
WARRINGTON, FLA. 32507
(904) 455-8905
Fig. 5

RA

DISASSEMBLING AND REPLACEMENT

1. Replacing ASA (film speed) scale assembly (#1, #6 and #11). See Fig.1.

1 - 1 Peel off leatherlet #9. Unscrew set screw #7 to remove ASA scale assembly.

1 - 2 Replace ASA dial assembly A4.

1 - 3 Insert the end of ASA-scale pin #6 through the hole in spring washer #13 into the groove on #12 (rotating base). Fasten screw #7 tightly.

1 - 4 The spring washer should have a torque of 500 g/cm - 1000 g/cm, for rotating the ASA-scale (#1).

2. Replacing T-dial knob (#3). See Fig. 1.

2 - 1 Perform 1 - 1.

2 - 2 Remove spring washer #13, to replace T-dial knob #3.

2 - 3 Bring the numeral 1000 on the T-dial coupling (#14) opposite the index dot on #50 (finder body). Insert T-dial shaft #2 into the square hole in the knob #3 in such a way that the F-number figure 1.4 on the side of the knob #3 comes to halfway between the figures 1 and 2 (of #14).

2 - 4 Perform 1 - 3 and 1 - 4.

Caution in reassembling

2 - a Be sure that T-dial knob #3 is in contact with stopper screw (#15B).

3. Replacing T-dial coupling #14. See Fig. 1.

3 - 1 Perform 1 - 1. Remove ASA (film speed) scale assembly A4, T-dial knob #3 and spring washer #13.

3 - 2 Draw out T-dial assembly A10 (T-dial coupling #14, T-dial coupling shaft #2 and screw #47).

3 - 3 Replace T-dial assembly A10.

3 - 4 If need arises to separate #14 from #2, unscrew #47.

3 - 5 Perform 2 - 3.

3 - 6 Perform 1 - 3 and 1 - 4.

Caution in reassembling

3 - a. Apply oil #G8181 to #2.

3 - b. See Caution 2 - a.

4. Replacing T-dial gear #15. See Fig. 1, 2, 3 and 5.

4 - 1 Unscrew prism housing screws #18, #45 and #56x2. Remove prism housing assembly A2 together with penta-prism assembly A8 and eyepiece assembly A-11, etc. from the finder body assembly.

4 - 2 Perform § 1, § 2 and § 3.

4 - 3 Unscrew bottom cover screw #53, to remove bottom cover #61.

4 - 4 Fitting the greove on rotating base (#12) to the stopper screw (#15B), mark the position where the resistor gear #21 of functional resistor assembly B2 engages in the deepest position with the T-dial gear (#15).

4 - 5 Unscrew ASA-shaft nut #8, using a wrench. Then, remove #12.

4 - 6 Remove assembly consisting of T-dial gear #15, ASA-shaft #4 and screws #15A, and then T-dial spring retainer #10, T-spring base #10A and T-dial spring #5. Take caution not loss these small pieces.

4 - 7 Unscrew screw #15A. Then, #15 will be separated from #4.

Caution in reassembling

4 - a Take the cautions given in § 1, § 2,and § 3.

4 - b Use oil #G8181.

4 - c See §13 to get the measuring accuracy.

5. Replacing top cover assembly (#52, #53 and #57x2). See Fig. 2.

5 - 1 Peel off leatherlet #63.

Remove assembly A13 (F-number frame #58A and F-number scale window #48 made of acryl).

5 - 2 Unscrew cover screw #55, to remove assembly A1 (F-number window holer #58 and screws #57).

5 - 3 Replace top cover assembly A1 with the new one.

5 - 4 Replace leatherlet #63 with the new one.

6. Disassembling switch assembly. See Fig. 1, 2, 3 and 5.

A. For repairing switch change-over plate

6A - 1 Perform 4 - 1.

6A - 2 Perform 4 - 3.

6A - 3 Put marking on T-dial gear #15 and on resistor gear #21.

6A - 4 Perform 5 - 1 and 5 - 2.

6A - 5 Unsolder fixed brush #31. Unscrew meter sase screw #38A. Meter assembly B1 (#96, #35, #36, #47A and #150) will be made free. (Merely connected with the finder body by lead wire.)

6A - 6 Unscrew functional resistor assembly screw #39.

Remove functional resistor assembly B2 (#21, #22, #24, #25, #25A, #26, #27, #28x4, #29x2, #21, #32x2, #33x2, #34, #97 and #123), taking care of the meter assembly.

6A - 7 Unscrew battery bottom plate screw #90, to remove battery plate #92 and terminal spring #94.

6A - 8 Release change-over plate spring screw #122, to remove #117 (change-over plate spring A), #117A (plate spring B), #118 (insulator plate A) and #118A (printed wiring plate).

To replace the spring (#117), it should be unsoldered.

B. For repairing switch button

6B - 1 Perform from 6A - 1 to 6A - 6.

6B - 2 Unscrew #122 to make free #117, #117A, #118 and #118A.

6B - 3 Insert a screw driver into the slot on nut #116, to take out #114 (external change-over button A) by removing the nut #116.

6B - 4 #114 will be taken out together with #120 (the spring plate A). #115 (change-over button B) will also be removed, #121 (spring B) being left in the hole in the finder body (#50).

Caution in reassembling

6 - a Fasten securely #116 and #114, using cementing agent.

6 - b Do not shift the geared position of #21 (resistor gear) to #15 (T-dial gear).

6 - c The bottom surface of #21 should not be in contact with #118A and with #94 (terminal spring).

6 - d Take good care of the meter (#96).

7. Replacing mirror holder assembly A6 (#44 and G2). See Fig. 3.

7 - 1 Perform 4 - 1.

7 - 2 Unscrew mirror holder screw #38A, to remove the mirror holder assembly (#44 and G2 - a small reflecting mirror) from the prism housing #51.

7 - 3 Replace A6 with the new one.

7 - 4 Mirror G2 is adhered to the mirror holder (#44).

Caution in reassembling

7 - a To correct the inclination of the mirror holder assembly, manipulate the adjusting screws (#44A).

7 - b Attach the mirror carefully, so that neither tilting nor detaching would take place.

7 - c Attach #44 to #51, after the mirror has been adhered tightly.

8. Disassembling aperture coupling assembly A3. See Fig. 4 and 5.

A. For repairing incorrect movement of vertical slider #68, sliding shoe A (#72) and B((#86).

8A - 1 Unscrew front cover screws #53 to remove front cover #52A. See Fig. 2.

8A - 2 Unscrew rail screws #56a to remove aperture coupling assembly A3, taking caution not to let #68, #77 (cam roller) and #83 (slider spring) spring out.

8A - 3 Remove rails #60, #68 and #83, taking care not to loss steel ball #107.

8A - 4 Release three slider screws #69 on #77 and #86.

8A - 5 Insert #68 between #72 and #86. Moving #72 and #86 to each other, fasten screws #69 tightly so as to get smooth movement of #68.

8A - 6 Releasing two screws #69 on the plate #70, move #70 and #87 (groove plate) for adjustment.

Caution in reassembling

8A - a Check for the correct rotation of aperture ring #34.

8A - b In attaching #60 to the finder body (#50), fit roller #79 to sliding cam #59, and insert coupling pin #27 into the groove on #87. Fasten it tightly with screws #56.

8A - c Use oil #G8181.

B. For repairing not-smooth rotation of aperture ring. See Fig. 2, 3 and 5.

8B - 1 Perform 4 - 1.

8B - 2 Perform 8A - 1 and 8A - 2.

8B - 3 Perform 5 - 1.

8B - 4 Perform 4 - 3.

8B - 5 Perform 6A - 3.

8B - 6 Perform 6A - 5.

8B - 7 Perform 6A - 6.

8B - 8 Remove retaining ring #22, using a wrench. Get smooth rotation of #34.

Caution in reassembling

8B - a Assemble moving brush #25 and fixed brush #31 so as to be in good contact with variable resistor #97.

8B - b In attaching functional resistor assembly B2, take care not to damage the meter (#96).

8B - c See 8A - b.

8B - d Take care of the meter assembly while being attached.

8B - e After the meter assembly has been attached, do not forget to attach dust-tight covering #64a.

8B - f Do soldering of fixed brush #31.

9. Replacing meter assembly B1 (#91, #35, #36, #47A and #15C). See Fig. 3 and 5.

9 - 1 Perform 4 - 1.

9 - 2 Perform 5 - 1.

9 - 3 Unsolder semi-fixed resistor #89 on the side where it is connected to the meter assembly. Release the one of screws #30 which attaches B2, to remove terminal #15C.

9 - 4 Unscrew meter casing screws #38A to remove meter assembly B1 (meter #96, meter casing #35, back plate #36, meter screw #47A and terminal #15C).

9 - 5 Replace meter assembly B1 with the new one.

Caution in reassembling

9 - a See § 21 C and § 23 A.

9 - b Take care of the other parts soldered.

10. Replacing functional resistor assembly B3 (#21 and #97). See Fig. 5.

10 - 1 Perform 4 - 1.

10 - 2 Perform 4 - 3.

10 - 3 Perform 5 - 1 and 5 - 2.

10 - 4 Perform 6A - 3 and 6A - 5.

10 - 5 Perform 6A - 6.

10 - 6 Unscrew retaining ring #22, using a wrench. The following four units will be detached from each other.

1. Resistor gear #21 and functional resistor #97 (assembly B1).
2. Aperture ring #34, coupling pin #27, aperture brush #25, aperture brush plate #25A, aperture scale #26 and screws #32 and #33.
3. Attaching piece #24, fixed brush #31, screw #29, brush #32 and collar assembly #33.
4. Waved washer #123.

10 - 7 Replace assemblies #21 and #97 with the new ones.

Caution in reassembling

10 - a In replacing #21 and #97, see §21 D and §23 B.

10 - b Attaching of #21 and #97 should be done on the basis of EV 15.

10 - c Temporarily fix #24 by means of screw #33. Then, set the pin (#27) of the aperture ring to the position F/11, after removing #21 (temporarily fixed) from #15 (gear), so that the resistance between both brushes is as much as shown by the green figure marked on the bottom surface of gear #21.

Take caution in this case not to derange the position of aperture, shutter speed and ASA (film speed) value.

10 - d See Caution in Reassembling in §8 B.

10 - e Set screw #15A at the center of the adjusting grooves on the bottom of the T-dial gear.

10 - f To assure the accuracy, see §13.

11. Replacing semi-fixed resistor #89. See Fig. 5.

11 - 1 Perform 5 - 1.

11 - 2 Perform 5 - 2.

11 - 3 Unsolder #89.

11 - 4 Replace #89 with the new one.

Coution in reassembling

11 - a To assure the accuracy, see §21 G and §23 E.

12. Replacing CdS cells #98. See Fig. 3.

A. Replacing printed wiring plate assembly C1 (#106, #42, #88, #98x2, and #113).

12A - 1 Perform 4 - 1.

12A - 2 Unscrew printed wiring plate #56a, to remove printed wiring plate #106 together with eyelet #42, CdS cells #98 and fixed resistor #113.

12A - 3 Replace the printed wiring plate with the new one.

12A - 4 To assure the accuracy, see §23 G.

B. Replacing CdS cells only

12B - 1 Perform 4 - 1.

12B - 2 Perform 12A - 2.

12B - 3 Unsolder the cell to be replaced at two points.

12B - 4 Replace the cell with the new one.

12B - 5 For selection and for assuring the accuracy of the CdS cells, see §21 A and §23 D.

Caution in reassembling

12 - a See §21 H for correct directioning of the CdS cells.

12 - b With the printed wiring plate assembly C1 attached to the prism housing assembly (A2) and mounted on the finder body, #88 and #89 (fixed resistor) on the C1 should not be in contact with any other part.

12 - c Take good care in handling the printed wiring assembly.

13. Adjusting the position of functional resistor

13 - 1 Turn ASA film speed scale #1, so that the hands of the screws (#15A) come in sight through two holes found in the T-dial shaft (#2).

13 - 2 Inserting a screw driver through the two holes in #2, slightly release screws #15A.

13 - 3 Turn T-dial knob #3 to the left or to the right, depending upon whether the meter needle deflects to the plus or to the minus side from the correct point.

13 - 4 Fasten screws #15A tightly.

13 - 5 Apply lacquer to the heads of screws #15A, after the required accuracy is attained.

14. Replacing penta-prism assembly A8 (G1, G3, G4, and G7x2). See Fig. 3.

14 - 1 Perform 4 - 1.

14 - 2 Perform 12A - 2.

14 - 3 Unscrew prism retaining screw #40, to dismount the assembly A12 which consists of prism retaining spring #39 and vinyl tube #111.

14 - 4 Unscrew #29 (light acceptance lens retaining frame screw), to remove assembly A7, consisting of #16A (light acceptance lens retaining frame), #102 (light acceptance lens holder), #129 (light acceptance lens retainer) and G8 (light acceptance lens).

14 - 5 Taking good care of G7 (light acceptance prism), replace penta-prism assembly A8 with the new one.

Caution in reassembling

14 - a Before replacement, clean the glass surfaces thoroughly.

14 - b While inserting the penta-prism assembly into the prism housing (#51), take caution that G7 will not come in contact with #131 (eyepiece light-tight plates) attached to #51.

14 - c Taking the same caution as above, attach the light acceptance lens assembly (A7) to #51.

14 - d Do not injure the top surface of G4 prism, when attaching #39.

15. Replacing eyepiece lens assembly A-11 (G5 and G6). See Fig. 3.

15 - 1 Perform 4 - 1.

15 - 2 Perform 12A - 2.

15 - 3 Release #125 (eyepiece lens set screw) on the rear surface of #51 (prism housing).

15 - 4 Peel off leatherlet #127. Unscrew #91 (eyepiece lens frame set screw), to remove the eyepiece lens frame (#16).

15 - 5 Remove eyepiece lens assembly (G5 and G6) and eyepiece lens holder plate #126.

15 - 6 Replace the eyepiece lens assembly with the new one.

15 - 7 Insert the replaced eyepiece lens assembly and #126 into #51.

15 - 8 Place #16 on top. Fasten #91 tightly.

15 - 9 Facing the eyepiece side of #16 downward, drop G5 and G6 to the side of #16. Fasten #125. G5 and G6 will be retained by #126.

15 - 10 Apply lacquer to the head of #125 for locking.

Caution in reassembling

15 - a Do not fasten #91 after #125 has been fastened, to avoid breaking of G5 or G6.

16. Adjusting meter needle window in the finder

A. Vertical displacement (See Fig.6)

16A - 1 Perform 4 - 1.

16A - 2 To correct the vertical displacement, turn the small mirror (G2) upward or downward.

If the window is to be set farther away from the finder viewfield, fasten the adjusting screw (#44A). If it is to be set nearer, release the screw. In either case, make the adjustment, viewing through the finder eyepiece.

B. Inclination

16B - 1 Perform 4 - 1.

16B - 2 To adjust the leftward inclination of the window, twist the mirror (G2) to the left. To correct the rightward inclination, twist the mirror to the right, viewing through the finder eyepiece.

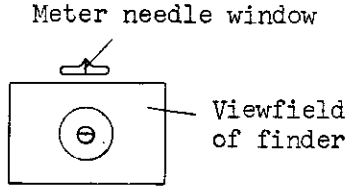


Fig. 6

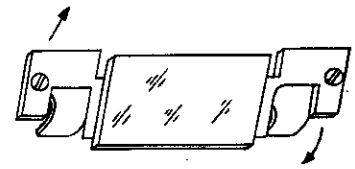


Fig. 7 The arrows show the directions in which the needle window when tilted to the right shoudd be twisted for correction.

C. Lateral displacement (See Fig. 5)

16C - 1 Perform 4 - 1.

16C - 2 For correction, move meter assembly B1 (#96, #35, #36, #47A and #15C) to the right or to the left.

16C - 3 Release meter set screw #38A.

If the meter needle window is located too far to the left, move the assembly to the right, viewing from the eyepiece of the finder.

17. Cleaning penta-prism assembly A8. See Fig. 3.

17 - 1 Perform §14.

17 - 2 Clean the prism assembly without removing it from prism housing #51.

17 - 3 Refer to the cautions given in §14.

18. Cleaning eyepiece lens assembly A-11

18 - 1 Perform §15.

18 - 2 For the assembling procedure and the caution to be taken, refer to §15.

19. Dusting meter needle window. See Fig. 5.

19 - 1 Perform 4 - 1.

19 - 2 Unscrew meter attaching screws #38A, to detach meter assembly B1.

Clean the acryl window frame (#37) from the inside, using a feather.

20. Tools and testers needed for disassembling and adjustment

Refer to "The chart of Repairing Tools" (for Nikon F camera, photomic finder and photomic T finder), to be available separated.

21. Specifications for electrical parts

A. CdS cells

The following 4 types of CdS cells are to be prepared, including those to which various positive films are to be attached for sensitivity adjustment.

Table 1.

EV Group	EV 4 (0.16 lux)	EV 7 (1.25 lux)	EV 13 (80 lux)	EV 17 (1250 lux)
Red	KΩ KΩ 81 ± 190	KΩ KΩ 20 - 27.5	KΩ KΩ 1.22 - 1.6	Ω Ω 200 - 310
Blue	145 - 340	36 - 48	2.1 - 2.8	350 - 450
Yellow	95 - 250	24 - 36	1.4 - 2.1	240 - 390
White	110 - 290	27.5 - 42	1.6 - 2.4	270 - 450

B. Positive films (4 types)

Used for sensitivity adjustment of CdS.

Transmission of each film: 50%, 66%, 76%, 86%.

C. Meter (one type only)

Internal resistance: 1.7KΩ ± 50Ω

Torque: 12.15 mg/cm/90°

Weight of moving part: 190mg

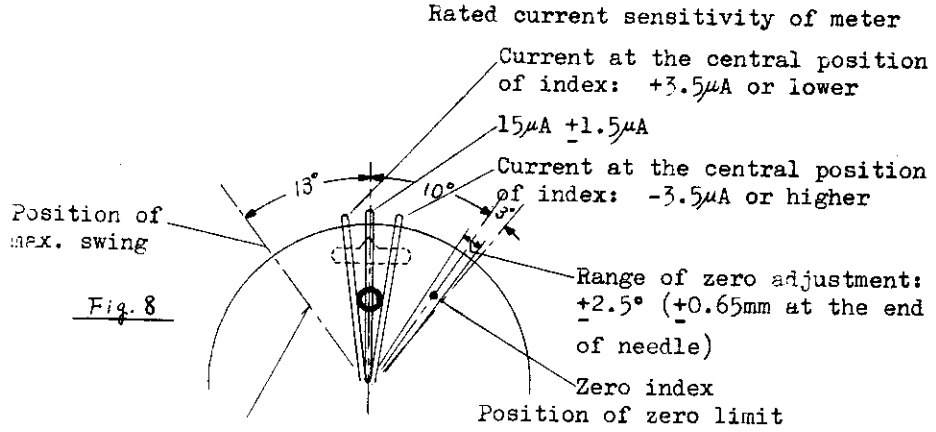

Rated current sensitivity of meter
Current at the central position of index: +3.5μA or lower
15μA ±1.5μA
Current at the central position of index: -3.5μA or higher
13°
10°
3°
Position of max. swing
Range of zero adjustment: ±2.5° (±0.65mm at the end of needle)
Zero index
Position of zero limit

Fig. 8

D. Functional resistor (one type). See Table 2.

Table 2.

EV	2	3	4	5	6	7	8	9
Upper limit	Limited	KΩ 11.43	KΩ 4.62	KΩ 2.33	KΩ 1.29	Ω 786	Ω 469	Ω 2895
Lower limit	11.43KΩ or more	7.41	3.30	1.78	1.05	635	387	242

10	11	12	13	14	15	16	17
1775Ω	114.5Ω	73.2Ω	46.6Ω	31.5Ω	22.2Ω	16.0Ω	12.1Ω
148	93.8	60.1	39.3	26.7	19.2	14.0	10.9

E. Fixed resistors (R_o) (8 types)

Resistance: 250KΩ, 300KΩ, 350KΩ, 400KΩ, 450KΩ, 500KΩ, 550KΩ, 600KΩ

F. Fixed resistors (R_1) (14 types)

Resistance: 100Ω, 120Ω, 140Ω, 160Ω, 180Ω, 200Ω, 250Ω, 300Ω, 350Ω, 400Ω, 450Ω, 500Ω, 550Ω, 600Ω

G. Semi-fixed resistor (R_2): One type only

Range of resistance: 0 - 10 KΩ

H. Printed wiring See Fig. 9.

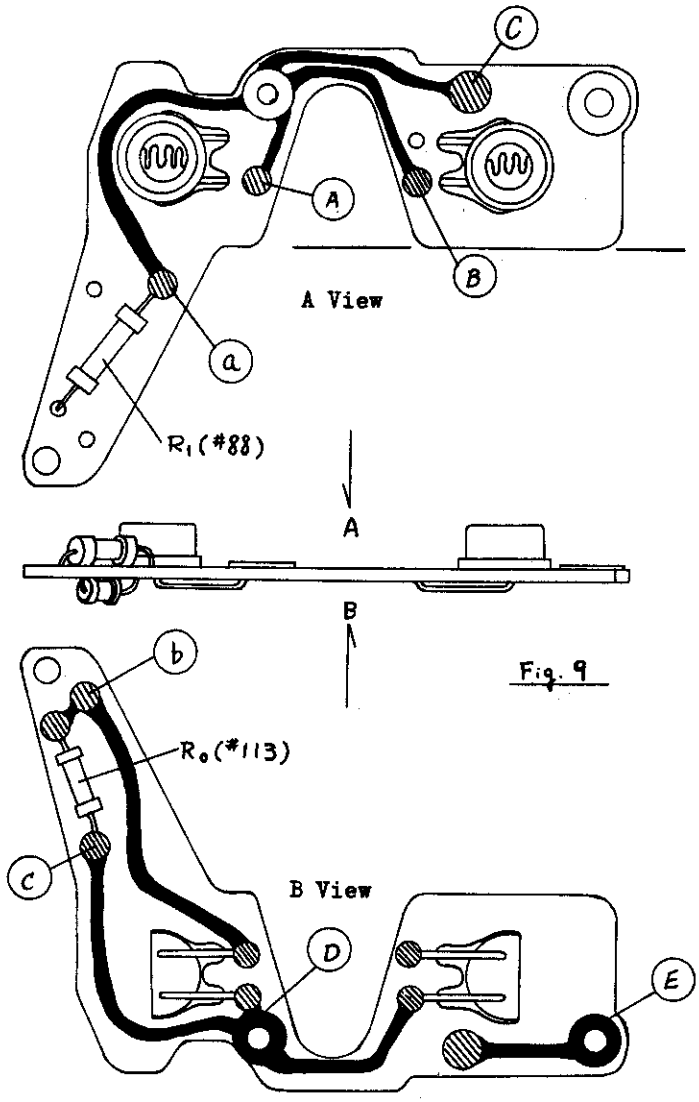


Fig. 9

The light acceptance part ∩∩∩∩ of CdS cells should not be tilted from this line.

The wiring plate should be positioned in such a way that two CdS cells can smoothly be inserted into the holes in #16A.

Also the soldered points A, B and C should form no short circuit with #16A.

If there is any fear of short circuit, reduce the amount of solder.

No non-conducting substance should exist on the surfaces D and E.

The fixed resistor R_1 and R_0 should be attached nearly in contact with the base plate.

I. Mercury batteries

Prepare two batteries, each 1.3V.

22. Adjustment

A. Before adjustment, temporarily assemble the printed wiring #106.

22A - 1 Take any one of the following combinations of two CdS cells (#98).

White + white

White + yellow

Yellow + yellow

Red + blue

Refer to Table 1. in §21.

22A - 2 For the temporary assembling, connect three wire leads to a, b and c on the printed wiring plate (Fig. 1), without using #88 (R_1) and #113 (R_0).

Caution:

The positions of #98 (CdS cells) should be matched with those of the existing light acceptance lens frames (#16A), so that, when attached to the printed wiring plate (#106) they can be smoothly inserted into #16A.

Also the light acceptance part ∩∩∩ of the CdS cells (#98) should tilt as little as possible.

22A - 3 Perform §23D - 1.5 and §23D - 1.6.

B. Then, assemble the body (#50) as below.

22B - 1 Before assembling the functional resistor, make the adjusting range of the variable resistor (on the T-dial gear) equal on both sides. (Refer to §13.)

22B - 2 Make attachment of #21 and #97 on the basis of EV (exposure value) 15. Fix the functional resistor assembly B2 temporarily by means of screw #33. Set the pin (#27) of the aperture ring to the position F/11, removing the gear #21

(temporarily fixed) from #15 (gear), and turn it so that the resistance between both brushes is as much as shown by the green figure marked on the bottom surface of gear #21. In this case, take caution not to derange the setting of aperture, shutter speed and ASA value.

22B - 3 Adjusting the position of the functional resistor. Refer to §13.

3.1. Attach temporarily the resistor to the prism housing assembly (including the penta-prism and eyepiece) without the printed wiring plate (C1).

3.2. Then, attach the above temporarily assembled unit to the camera (provided with a 50mm F/1.4 lens and A-type viewfinder screen).

3.3. See that the resistance between the fixed brush (#31) and the body earth for EVs from 2 to 17 is within the range shown in Table 2. If not, find out such position (refer to §13. Fasten this tightly (but not to be lacquered).

22B - 4 Make wiring for the fixed brush (#31).

22B - 5 Mount the meter assembly (B1) and fix the wiring.

22B - 6 Carry out the wiring for #50, including that for the semi-fixed resistor #89.

22B - 7 Insert two batteries #99 into the battery chamber.

C. Adjustment proceeds as below.

22C - 1 Mount all the assemblies except the top cover assembly (A1), with the lead wire for the dial-type variable resistor attached to the printed wiring plate assembly.

22C - 2 Connect the dial-type variable resistor DR_0 (1KΩ - 1MΩ) to b and c on the wiring plate. (See Fig. 9)

Connect the DR_1 to a and b the same way.

22C - 3 With the DR_0 set to 250KΩ and the DR_1 to -100Ω, face the camera toward the brightness box set to EV 9.

22C - 4 Manipulate #89 (semi-fixed resistor R_2), until the meter needle comes to the center.

22C - 5 Facing the camera toward the brightness box set to EV 4, manipulate DR_0 until the pointer needle comes to the center. Take the result thus obtained for the value of R_0 (#113). R_0 can be made infinity, by removing R_0.

22C - 6 Facing the camera toward the brightness box set to EV 15, manipulate DR_1 until the meter needle comes to the center. The resistance should not be 100Ω or lower, to avoid much drain on the mercury batteries, when the lens is exposed to a subject of high brightness.

Permissible error is within ± 1/2 EV in this case. The resistance thus obtained is taken for the value of R_1 (#88).

22C - 7 Mount the R_1 and R_0, after determining their resistances.

D. Checking the accuracy

Check the measuring accuracy of meter, using the camera.

The accuracy should be within the following ranges:

± 1/2 EV at EV 7, 9 and 15

± 1 EV at EV2 and EV 17

± 2/3 EV at other EVs

The selectivity should be such that the needle runs out of the circle of 0.8mm in dia., when the shutter speed or F-number is changed one step from the centered position.

E. Adjustment to be made after top cover assembly A1 mounted

Release screws #15a; turn the T-dial (Refer to §13). Then, the variable resistances at all points will change in the same

proportion. However, be sure that neither insulation nor short circuit occurs at EV 2 and EV 17.

(The needle needs only to move smoothly, while it is being set toward EV 2 and EV 17.)

23. Adjustment after replacement of parts

A. Meter assembly only replaced. Refer to §9.

23A - 1 Replace meter assembly. In this case, get the original gearing position between #21 (resistor gear) and #15 (shutter speed dial gear).

23A - 2 Assemble all other parts except the top cover assembly (A1).

23A - 3 Attach this assembled unit including the meter to the camera.

23A - 4 Facing the camera toward the brightness surface EV 9, center the meter needle to center by moving the semi-fixed resistor (#89). If the adjusting range of R_2 is not sufficient, make adjustment by turning the T-dial knob (refer to §13). Be sure that neither insulation not short circuit takes place at EV 2 and EV 17.

23A - 5 See that the accuracy within ± 1/2 EV is obtained at EV 4 and EV 15.

23A - 6 If any one of these points is not within the specified accuracy range (refer to §22), manipulate the semi-fixed resistor (#89) to get the points EV 4, 9 and 15 within ± 1/2 EV.

It is desirable to get the point EV 9 as near as possible to zero. In case the derangement at EV 4 is larger than at EV 9 or 15, or the adjusting range of the semi-fixed resistor (#89) is not sufficient, manipulate the T-dial knob (refer to §13).

Make certain that neither insulation nor short circuit takes place.

23A - 7 If the accuracy cannot yet be obtained, check the parts: meter assembly, functional resistor, printed wiring including CdS cells, semi-fixed resistor and fixed resistor for any defect. If there is no defect, replace R_2 (#88) and R_o (#113) should be replaced.

B. Functional resistor replaced

23B - 1 Replace the attaching gear (#21) and functional resistor (#97) only. Or replace the functional resistor assembly (B2).

1.1. Perform 22B - 1.

1.22 Perform 22B - 2.

1.3. Perform 22B - 3.

1.4. Perform 22B - 4.

23B - 2 Perform 23A - 2 and 23A - 7.

C. Printed wiring plate C1 replaced

23C - 1 Replace the printed wiring plate assembly (C1).

23C - 2 Perform 23A - 2 and 23A - 7.

D. CdS cell or cells #98 replaced

23D - 1 Replacement of two CdS cells #98

1.1. Replace the CdS cells on the printed wiring plate assembly (#C1) with any combination of two cells: white + white, white + yellow, yellow + yellow or red + blue.

1.2. Unsolder the fixed resistor R_1 (#88) and R_o (#113).

1.3. Connect 3 lead wires to the terminals a, b and c (Fig.9) on the printed wiring plate, with #88 and #113 removed.

1.4. Mount the CdS cells (#98), in such positions that they can be inserted smoothly into the light acceptance lens frames (#16A), after being attached to the printed wiring plate (#106). The light acceptance part of each CdS cell should be tilted as little as possible.

1.5. Connect the dial variable resistor DR_0 (1KΩ - 1MΩ) to be and c.

Connect the dial variable resistor DR_1 (1Ω - 1KΩ) to a and b.

1.6. Adjusting the sensitivity of CdS cells

Temporarly assemble all parts except the body (#50) and the top cover assembly (A1), with DR_0 set to 250 KΩ and DR_1 set to 100Ω.

Fit the printed wiring plate (#106) on the camera; then face this toward the brightness surface EV 9.

Resistance between the terminals on the printed wiring plate assembly (C1) should indicate 5.8KΩ - 6.9KΩ.

If the resistance is less than 5.8KΩ, adhere the positive film on either or both of the CdS cells, so that 5.8KΩ - 6.9KΩ is obtained, one or two sheets of positive film can be used.

(Use "Cemedine Super"as the adhering agent)

1.7. Adjustment for EV 4

Face the CdS cells toward the brightness surface EV4.

Determine the resistance DR_1 (between a and b), so that the resistance R_1 between the terminals on the printed wiring plate assembly (C1) is within the range 55KΩ - 68KΩ. Never DR_1 should be below 100Ω.

1.8. The adjusting ranges will be summarized as follows (for the "camera"):

EV (ASA100)	4	9	15
Range of resistance	55KΩ-68KΩ	5.8KΩ-6.9KΩ	475Ω-550Ω

1.9. Finally, solder #88 (R_1) and #113 (R_0), determined in the above way, onto #106 (printed wiring plate).

1.10. Perform 23A - 2 to 23A - 7.

23D - 2 Replacement of one of the CdS cells #98

2.1. Observing the color of the cells not replaced (refer to §21, A) select the one so that a new combination is obtained: white + white, white + yellow, yellow + yellow or red + blue.

2.2. Perform 23D - 1.2 to 23D - 1.10.

E. Replacing of semi-fixed resistor #89 (R_2)

23E - 1 Replace #89 with the new one.

23E - 2 Perform 23A - 2 to 23A - 7.

F. Replacement of shutter-dial gear #15 and aperture brush #25

23F - 1 Replace #15 or #25. The position of the functional resistor is about at the center of adjusting range (refer to §13).

23F - 2 Assemble all the parts.

23F - 3 Attach this assembled unit to the "camera".

23F - 4 Facing the lens of the camera toward the brightness EV 9, Turn the functional resistor until the meter needle comes to the center. Be certain that neither insulation nor short circuit takes place at EV 2 and 17.

23F - 5 See that the accuracy within ± 1/2 EV is attained at EV 4 and 15.

23F - 6 If any point is found out of the accuracy (refer to 22,D)

turn the functional resistor for EV4, 9 and 15. Be sure that neither insulation nor short circuit takes place.

23F - 7 If a satisfactory result is not yet obtained, remove the top cover and turn the semi-fixed resistor R_2 (#39) to get the accuracy (refer to 23A - 4 and 23A - 7).

G. Replacement fixed resistor R_o (#113)

23G - 1 Remove R_o (#89) from the printed wiring plate (#106).

23G - 2 Make leads from the points b and c (Fig. 9) on the printed wiring plate.

23G - 3 Connect the dial variable resistor DR_o (1 KΩ - 1 MΩ) to the leads from b and c.

23G - 4 Assemble all the parts except the top cover assembly (A1).

23G - 5 Face the camera toward the brightness EV 4.

23G - 6 Turning DR_o, make centering of the meter needle to the center. Take this DR_o for R_o.

It is alsc possible to make DR_o infinity, by removing R_o.

23G - 7 Solder R_o to #106 (printed wiring plate).

23G - 8 Check the accuracy. This is to be within ± 1/2 EV at EV 4.

H. Replacement of fixed resistor R_1 (#88)

23H - 1 Remove R_1 from the printed wiring plate #106.

23H - 2 Make leads from the points a and b, corresponding to R_1 on the printed wiring plate.

23H - 3 Connect the dial variable resistor DR_1 (1Ω - 1 KΩ) to the leads from a and b.

23H - 4 Assemble all the parts except the top cover assembly (A1).

23H - 5 Face the "camera" toward the brightness surface EV 15.

23H - 6 Turning DR_1, center the needle, so far as the range is

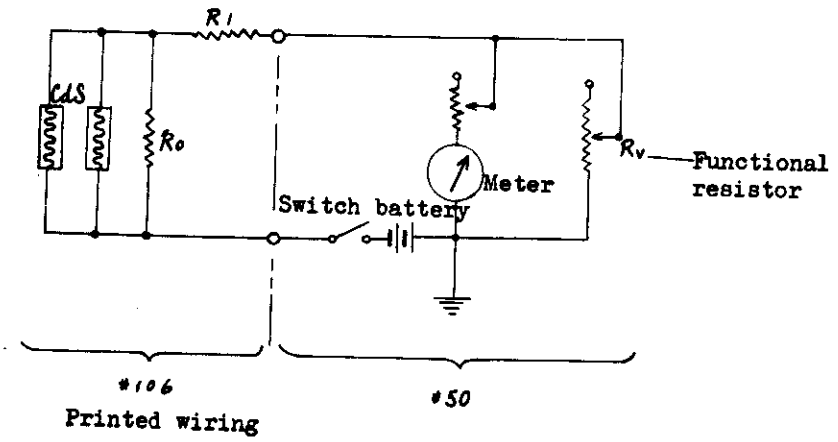
not less than 100Ω. (It needs only to be within the accuracy ± 1/2 EV.) Take this DR_1 for R_1.

23H - 7 Solder R_1 to #106.

23H - 8 Check the accuracy. This is to be within ± 1/2 EV at EV 15.

24. Circuit

Fig. 10



TROUBLE CHART

Trouble	Cause	Checking	Remedy
Meter needle does not move.	1. Batteries are not correctly positioned in the battery chamber.	The plus (+) and minus (-) sides of the batteries are not correctly faced to each other.	Make correction
	2. Drain on the batteries.	Movement of the needle, when the meter is faced toward the brightness EV 15, is less than 1/2 step as compared with the case where new batteries are used.	Replace the batteries.
	3. Disconnection	Test the circuit, using the tester.	Connect the disconnected points or replace disconnected parts.
	4. Short circuit	Test the circuit using the tester.	Insulate the short-circuited part or replace it.
	5. Movable part of the meter is seized.	The circuit is correct. The meter needle does not move even when blown. The needle stops at an indefinite position.	Remove dust or the like. Replace the meter.
	6. Deterioration of CdS cells	The circuit is correct. The meter is correct. Set the resistor to EV 17 and face the camera toward the brightness EV4.	Replace the printed wiring plate assembly. Replace one or two of the CdS cells.

		The resistance between both terminals in the battery chamber without battery is extremely far from 55 - 68 KΩ.	
Unstable indication of meter needle	1. Disconnection	Test the circuit using the tester.	Make connection. Replace the disconnected part.
	2. Short circuit	Test the circuit using the tester.	Insulate the short-circuited part. Replace the short-circuited part.
	3. Moval part of the meter is seized.	The circuit is correct. The needle does not move even when blown. The needle stops an indefinite position.	Remove dust or the like. Replace the meter.
	4. Too large slack.	Facing the meter toward a definite brightness, make centering of the needle from both sides. A remarkable difference in the settings occurs.	Remove the slack at the position where the mechanical slack takes place.
	5. Friction on the needle.	The position of the centered needle at EV 9 largely deffers from that after once made moved to EV 15 and returned.	Replace the meter.
	6. Unbalance of the meter needle	Indication of the needle varies largely, depending upon the position of the meter.	Replace the meter.

	7. Insufficient selectivity	After centering the needle, change the EV setting one step. The needle moves out of the circle (0.8mm in dia.) (within the range EV 3 to EV 16).	If the selectivity is not enough near EV 4, increase the resistance R_0 so far as the accuracy is maintained. If the selectivity is enough at EV 9 but not at EV 15, increase R_1 so far as the accuracy is maintained and the resistance becomes not less than 100Ω.
Inaccuracy of indication at EV 4 only.	Incorrect adjustment of R_0	The indication is not accurate only at EV 4, but is accurate at EV 9 and 15.	If so, replace R_0.
Inaccuracy of indication at EV 9 only.	Incorrect adjustment over the whole range.	The indication is not accurate only at EV 9, but is accurate at EV 4 and 15.	Perform the adjustment 23 (from 23A - 2 to 23A - 7) for replacing the parts.
Inaccuracy of indication at EV 15 only.	1. Functional resistor is not good.	Not accurate at EV 15 only but accurate at EV 4 and 9. Disconnect the fixed brush and check the resistance between the fixed brush and the earth, referring to Table 2 in §21.	Replace the functional resistor.
	2. Incorrect adjustment of R_1	Not accurate at EV 15 but accurate at EV 4 and 9. The resistance measured as above in 1 is within the specified range.	Replace R_1.

Inaccuracy at EV 4, 9 and 15, EV 4 and 9 or EV 9 and 15	1. Incorrect adjustment over the whole range	Not accurate at EV 4, 9 and 15, EV 4 and 9 or EV 9 and 15.	Perform the adjustment 23 (23A-2 to 23A - 7) for replacement of parts.
	2. Incorrect positioning of the functional resistor	The accuracy is not sufficient to almost the same degree at EV 4, 9 and 15.	Readjust the T-dial knob.
	3. Sensitivity of the meter is low.	The accuracy is not be sufficient to almost the same degree at EV 4, 9 and 15. The current is not within the rated value 15 μA $\pm$1.5 μA.	Replace the meter.
	4. Incorrect functional resistor	The accuracy is not sufficient especially at EV 15. Disconnect the fixed brush and check for the resistance between the fixed brush at the earth, referring to Table 2 in §21.	Replace the functional resistor.
	5. CdS cells are deteriorated.	Inaccuracy other than those mentioned above in 1, 2 and 3 happens.	Replace the printed wiring. Replace one or two of CdS cells.

Note:

With regard to short circuit, take special caution of the following:

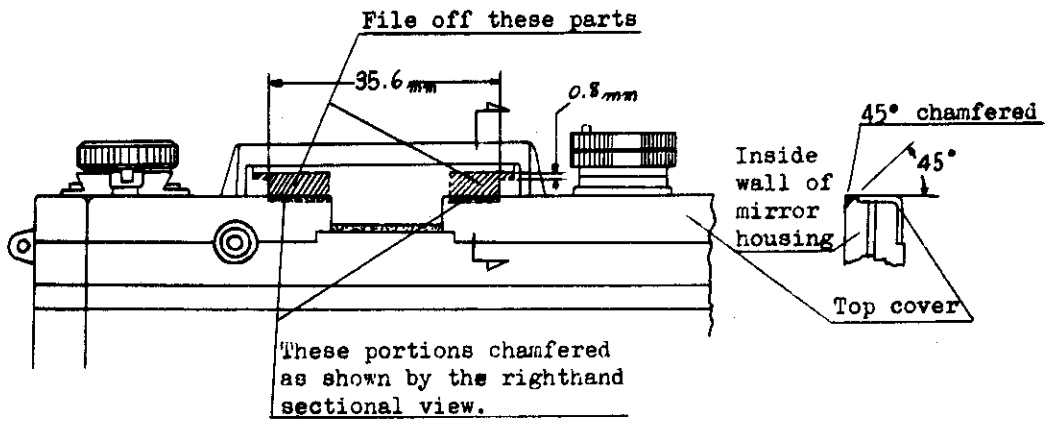
1. Short circuit between #21 (resistor attaching gear) and #94 (pole spring) or #118A (printed wiring).
2. Short circuit between the soldered point of #110 (contact lug plate) and #50 (body) or #21.
3. Short circuit between #21 and #31 (fixed brush).

FITTING PHOTOMIC-T FINDER TO NIKON F

The Photomic-T Finder does not fit to the Nikon F camera body of earlier type without some alteration as described below.
We distinguish the new type Nikon F camera body which is delivered as Nikon F Photomic-T (with Photomic-T Finder mounted or to be mounted) with a red dot in front of the serial number engraved on the camera top, for the time being, up to No. 6602847, for example, "6602846". The numbers up to 6700000 are missing. From No. 6700001 on, however, no red dot will be marked on the Photomic-T type camera.

How to Fit Photomic-T Finder to Earlier Type Camera Body

If the Photomic-T Finder is to be fitted to the earlier type Nikon F body, the top rear portions of the mirror housing which interfere with the both sides of the finder eyepiece, should be filed off. First, remove the viewfinder screen from the camera body to prevent dust or chips from entering. Then, using a file and placing the jig (available on order) exactly in position into the mirror housing, file off the portions indicated by hatching in the fig. Finally, the filed surfaces are to be finished black and dull with lacquer.

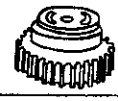
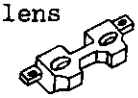
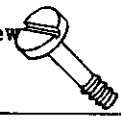
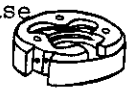


Rear View

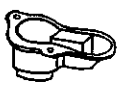
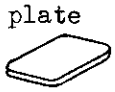
Sectional View

No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-1	ASA dial plate	1	A4	1	△	
2	T-dial shaft	1	A10	1	△	
2A	Screw (for #41 - #51) D=2 l=2 d=1.4 H=0.3	6	A2	3	○△	
3	T-dial knob	1		1	○	
4	ASA dial shaft	1		1	○	
5	T-dial spring d=0.75 n=5	1		1	○	
6	ASA dial pin	1	A4	1	△	
7	ASA dial screw	1		1	○	
8	ASA dial screw nut	1		1	○	
9	ASA dial screw leather cover	1		1	○	
10	T-dial spring holder	1		1	○	
10A	T-dial spring washer D=14 d=9 t=0.3	1		1	○	
11	ASA dial pawl pin	1	A4	1	△	
12	Rotary washer	1		1	○	
13	Spring washer t=0.2	1		1	○	

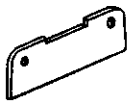
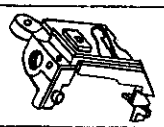
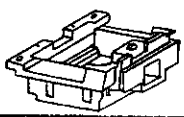
RB1

No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-14	T-dial	1	A10	1	△	
15	T-dial gear M=0.3 N=60 D=18 	1		1	○	
15A	T-dial gear set screw D=2 d=1.4 H=0.4 l=1.3	2		1	○	
15B	Stopping screw D=2.5 d=1.7 l=4.5 H=0.5	1		1	○	
15C	Terminal tip t=0.2	1	B1	5	○△	
16	Eyepiece frame	1		3	○	
16A	Light acceptance lens holding plate 	1	A7	3	△	
18	Body retaining screw D=2.5 l=3.5 d=1.7 H=0.5 	1		3	○	
19	Groove nog A	1	A2	3	△	
20	Groove nog B	2	A2	3	△	
21	Resistor gear M=0.3 N=160 D=48	1	B3	5	△	
22	Retaining ring	1	B2	5	△	
23	Spacer t=0.1 - 1	4		3	○	
24	Meter attaching base 	1	B2	5	△	

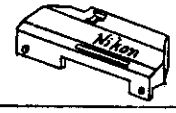
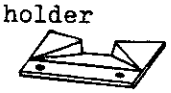
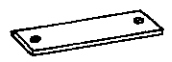
RB1

No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-25	Aperture diaphragm brush	1	B2	5	○△	
25A	Diaphragm brush auxiliary plate	1	B2	5	○△	
26	F-number scale plate	1	B2	5	○△	
27	Coupling pin	1	B2	5	△	
28	Screw D=2 l=1.4 d=1.4 H=0.5	6	A3 B2	4, 5	○△	
29	Fixed brush set screw D=2.5 l=3.5 d=1.4 H=0.5	4	B2	3, 5	○△	
30	Screw D=2.5 l=2.5 d=1.7 H=0.5	3		5	○△	
31	Fixed brush	1	B2	5	○△	
32	Insulation bush	2	B2	5	○△	
33	Insulation collar	2	B2	5	△	
34	Aperture diaphragm ring	1	B2	5	△	
35	Meter housing 	1	B1	5	△	
36	Meter back plate	1	B1	5	○	
37	Meter window acryl plate 	1		5	○	
38A	Meter back plate screw D=2.5 l=1.3 d=1.7 H=0.5	4		3, 5	○	

RB1

No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-39	Prism holding spring d=1.0	1	A12	3	△	
40	Prism holding screw D=4.5 l=3 d=2.6 H=1.2	1		3	○	
41	Bottom plate spring	2	A2	3	○△	
42	Eyelet	1	C1	3	△	
43	Dust-tight piece	5		3	○	
44	Mirror holder	1	A6	3	△	
44A	Prism adjusting screw	2	A2	3	○△	
45	Body retaining screw	1		3	○	
46	Back cover plate 	1		5	○	
47	Roller screw D=2 l=1.8 d=1.4 H=0.5	7	A3 A10	1, 2, 4	○△	
47A	Meter screw D=2 l=1.3 d=1.4 H=0.5	1	B2	5	○△	
48	Aperture window plate	1	A13	2	△	
49	Back cover plate screw D=2.5 l=3.5 d=1.7 H=0.5	2		5	○	
50	Finder body 	1		1. 2, 5	×	
51	Prism housing 	1	A2	3	△	

RB1

No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-51A	Prism housing bottom plate	1	A2	2, 3	○△	
52	Top cover	1	A1	2	△	
52A	Front cover 	1		2	○	
53	Front cover screw D=2 l=1.8 d=1.4 H=0.4	5		2	○	
54	Front plate screw D=2.4 l=1.5 d=1.7 H=0.65	2		3	○	
55	Top cover screw D=2.5 l=1.8 d=1.7 H=0.4	3		2	○△	
56	Body screw D=2.5 l=4 d=1.7 H=0.5	2		3	○△	
56a	Slide plate screw D=2.5 l=3.5 d=1.7 H=1	3		4, 5	○△	
57	Rivet	2	A1	2	△	
58	Aperture window holder 	1	A1	2	△	
58A	Aperture window frame	1	A13	2	△	
59	Slide cam	1		5	○	
60	Slide rail plate 	1	A3	4, 5	△	
61	Bottom cover plate	1		2	○	
62	Number plate	1	A5	3	△	

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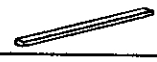
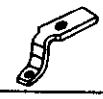
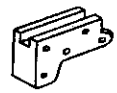
No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-63	Top cover leather	1		2	○	
64a	Meter dust-tight seat	1		5	○	
65	Number plate reverse side tin leaf	1	A5	3	△	
65a	Prism tin leaf 	1		3	○	
66	Aperture diaphragm slider	1	A3	4, 5	△	
67	Rotation stopper	1	A3	4	△	
68	Vertical slider 	1	A3	4	△	
69	Slider screw D=2 l=4.6 d=1.4 H=0.5	6	A3	4	○△	
70	Bogie plate	1	A3	4	△	
71	Roller stopping plate A	1	A3	4	△	
72	Vertical slide plate A 	1	A3	4	△	
73	Meter window plate (clear)	1	A9	2	△	
74	Meter window plate (opal)	1	A9	2	△	
75	Earth plate	1		2	○	

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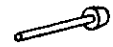
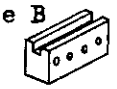
No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-76	Earth pin 	1		2	○	
77	Cam roller	1		4	○	
78	Spring shaft	2	A3	4	△	
79	Roller	4	A3	4	△	
80	Coupling pin	1	A3	4	△	
81	Cam roller shaft	1	A3	4	△	
82	Small collar	6	A3	4	△	
83	Slide spring d=0.23 N=20	1		4	○	
84	Roller shaft coller	1	A3	4	△	
85	Roller stop plate B	1	A3	4	△	
86	Vertical slide plate B 	1	A3	4	△	
87	Groove plate	1	A3	3, 5	△	
88	Fixed resistance R=100Ω - 600Ω(1/10W)	1	C1	3	○△	
89	Half fixed resistance	1		5	○	
90	Screw D=2.5 l=4.5 d=1.4 H=0.5	3		2	○	

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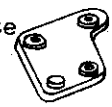
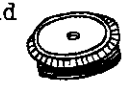
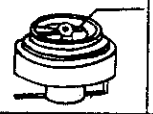
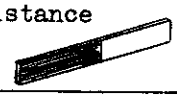
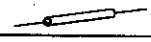
No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-91	Eyepiece screw	2		3	○	
92	Battery bottom plate 	1		2	○	
93	Battery chamber lid 	1	C2	2	△	
94	Pole spring t=0.2	1		2	○	
95	Insulation plate t=0.2	1		2	○	
96	Galvanometer 	1	B1	5	△	
97	Functional resistance 	1	B3	5	△	
98	CdS cell	2	C1	3	○△	
99	Mercury battery	2		2	◎	
100	Vinyl insulated cord  Black ℓ=140mm / Red ℓ=250mm	1 / 1		5	○	
101	Angle plate with	1	A2	3	○△	
102	Light acceptance lens holder	2	A7	3	△	
103	Light acceptance prism right cover	1	A2	3	△	
104	Light acceptance prism left cover	1	A2	3	△	
105	Washer t=0.2	2		3	○	

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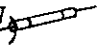
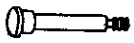
No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-106	Printed circuits plate	1	C1	3	○△	
107	Steel ball d=1/16"	1	A2	4	○△	
108	Insulation bush	2		3	○	
109	Click stop spring plate	1	A3	4	△	
110	Lag	2		3, 5	○	
111	Prism holding spring tube	2	A12	3	○△	
112	Zero setting window cover	1		2	○	
113	Fixed resistor R=100$^{K\Omega}$ - 400$^{K\Omega}$ (1/10^{W}) 	1	C1	3	○△	
114	Change-over button A 	1		2	○	
115	Change-over button B	1		2	○	
116	Nut	1		2	○	
117	Change-over spring A	1		2	○	
117A	Change-over spring B	1		2	○	
118	Insulator plate A t=0.2	3		2	○	
118A	Printed circuits insulated plate	1		2	○	

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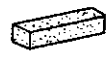
No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-118B	Scotch tape (insulation)			5	○	
119	Insulation base	1		2	○	
120	Change-over spring A d=0.23 n=3.5	1		2	○	
121	Change-over spring B d=0.29 n=3	1		2	○	
122	Change-over spring screw D=2.5 l=3.5 d=1.7 H=0.5	1		2	○	
123	Spring washer t=0.1	1	B2	5	△	
124	Click plate	1		4, 5	○	
125	Set screw d=1.4 l=2	2	A2	3	○△	
126	Eyepiece fastening plate	1		3	○	
127	Leather (black)	2		3	○	
128	Battery marking	1	C2	2	△	
129	Light acceptance lens holder	4	A7	3	△	
130	Prism cushion 	1	A7	3	○△	
131	Prism sheet	2	A2	3	○△	
132	Filter (film)	1 - 4		3	○	

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No. of Part	Name and Shape	Pcs. per Unit	No. of Subassembly	Ref. Fig. No.	Term of Sale	Remarks
20FD4-G1	Prism	1	A8	3	△	
G2	Reflecting mirror	1	A6	3	△	
G3	Lens	1	A8	3	△	
G4	Prism	1	A8	3	△	
G5	Lens	1	A11	3	△	
G6	Lens	1	A11	5	△	
G7	Prism	2	A8	3	△	
G8	Lens	4	A7	3	△	

RB1

PHOTOMIC T FINDER (20FD4) SUBASSEMBLY LIST

20FD4 - R.0109.A

No. of Subassembly	Name	Pcs. per Unit	No. of Constituent Parts (*: Main parts)	Ref. Fig.No.	Remarks
20FD4-A1	Top cover	1	*52, 57x2, 58	2	
A2	Prism housing	1	*51, 2Ax6, 19, 20x2, 41x2, 44Ax2, 51A, 101 103, 104, 125x2, 131 x2	3	
A3	Aperture diaphragm slider	1	*66, 28x2, 47x3, 60, 67, 68, 69x4, 70, 71, 72, 78x2, 79x4, 80, 81, 82x6, 84, 85, 86, 87, 107, 109	4	
A4	ASA dial	1	*1, 6, 11	1	
A5	Number plate	1	62, 65	3	
A6	Mirror holder	1	*44, G2	3	
A7	Light acceptance lens	1	*16A, 102x2, 129x4, G8x4, 130	3	
A8	Prism	1	*G4, G1, G3, G7x2	3	
A9	Meter window	1	*73, 74	2	
A10	T-dial	1	*2, 14, 47x2	1	
A11	Eyepiece	1	*G5, G6	3	
A12	Prism holding spring	1	*39, 111x2	3	
A13	Aperture window	1	*58A, 48	2	
B1	Meter	1	*96, 35, 36, 47A, 150	5	
B2	Variohm	1	*24, 22, 25, 25A, 26, 27, 28x4, 29x2, 31, 32x2, 33x2, 34, 123, B3	5	
B3	Resistor gear	1	*21, 97	5	

RA

No. of Subassembly	Name	Pcs. per Unit	No. of Constituent Parts (*: Main parts)	Ref. Fig.No.	Remarks
20FD4-C1	Printed circuits plate	1	*106, 42x2, 88, 98x2, 113	3	
C2	Mercury battery	1	*93, 128	2	

RA